

CivE 265: STRUCTURE AND PROPERTIES OF MATERIALS

Concrete Lab #1

Concrete is one of the most common civil engineering materials, and is used in vast quantities by developed economies. Understanding it, and its properties, are therefore critical for civil engineers.

The class should be divided into 13 approximately equal groups sizes (there should be 6 or 7 students in each group, not five). Each pair of groups will have one hour in the Civil lab, with Richard Morrison and Frank McCarthy. The TA will coordinate which of the six available one hour lab slots will be assigned to each pair of groups.

Notes: Your clothing will get a bit dirty and dusty. You must wear closed shoes – no sandals! Pay close attention to the safety lecture.

Procedure

Add 3 shovels of “stones”, 2 shovels of “sand”, and 1 shovel of Type 10 Portland cement to a pre-moistened concrete mixer. (The mixer should be thoroughly washed and spray wetted before you start, with no standing water in the bottom). Add just enough water to make the mixture moist, guided by your lab instructor (who will ensure that the same amount is added to each groups mixture). Measure the water you add to the nearest 100 ml.

Pour out the well-mixed concrete into a wheel barrow and fill five small (100x200 mm) test cylinders. Rinse the mixer with water.

Prepare a second batch, identical to the first, but add one of (circle the one you use):

75% 125% 150% 175% 200%

as much water as the first time, as directed by the TA or lab instructor. The intent is to have a range of different water quantities added to the concrete so that they can be compared between all the test groups.

Clean the mixers, tools, and wheelbarrow in preparation for the next group.